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BOEING VERTOL CO PHILADELPHIA PA

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PRELIMINARY INTEGRATED LOGISTICS SUPPORT PLAN FOR SINK RATE DEL--ETC(U)

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N62269-76-C-0341

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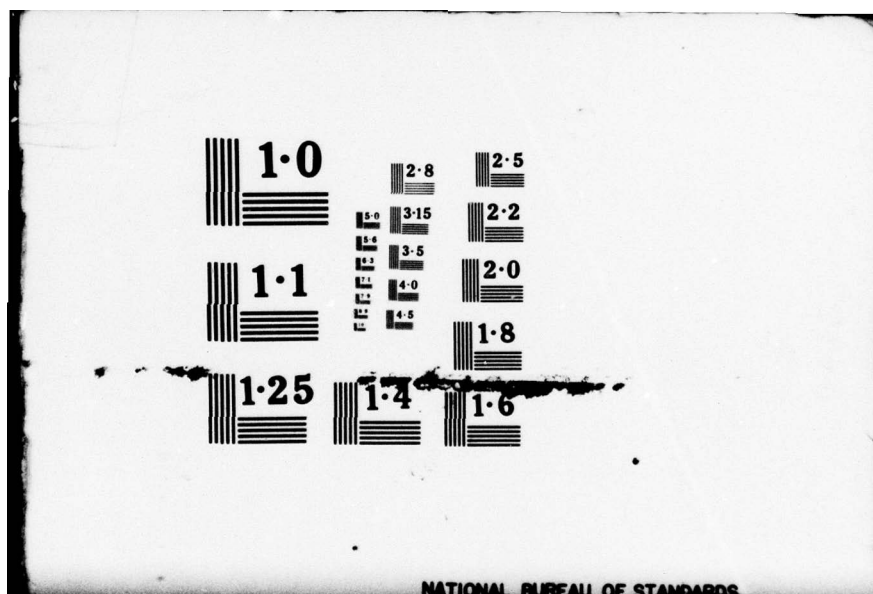


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ABSTRACT

This document defines the Preliminary Integrated Logistics Support Plan (PILS) which describes the support requirements; provisioning, procurement, and acquisition of parts, equipment and facilities; and performance of support activities for and during the "Sink Rate Delay/Improved In-Water Stability System for Helicopters", Development Program.

KEY WORDS

Maintenance Engineering Analysis (MEAS)

Support Equipment

Repair Parts

Supply Support

Training

Equipment Publications

Contract Maintenance

Special Test Facilities

Maintenance Evaluation

Transportation, Packaging, Storage and Handling (TPSH)

Management Support

Software Analysis Program (Phase III)

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1. INTRODUCTION

This plan describes the Contractor's program for definition of support requirements; provisioning, procurement, and acquisition of parts, equipment, and facilities; and performance of support activities for and during the Helicopter Flotation Program. This plan is presented in the general format contained in AR30A with individual sections (plans) tailored to address the Helicopter Flotation System (HFS) Development & Production Program requirements.

The following plans constitute the Contractor's Preliminary Integrated Logistics Support Plan (PILS):

- a. Management Support
- b. Maintenance Documentation and Analysis
- c. Support Equipment
- d. Repair Parts and Supply Support
- e. Training
- f. Equipment Publications
- g. Special Test Facilities
- h. Contract Maintenance
- i. Maintenance Evaluation
- j. Transportation, Packaging, Storage, and Handling

2. SUMMARY

One objective in the development of this plan was to make maximum use of the existing support concepts, procedures and resources. As such, the PILS has been structured, in detail, to use logistic support data and analyses developed during the Helicopter Flotation Study and the Life Raft Study, Contracts N62269-75-C-0469 and N62269-75-C-0454. Use of these data and analyses precludes duplication of effort and provides the visibility necessary to assure the maximum use of existing logistic resources for the Helicopter Flotation Study. This approach is summarized as follows:

a. Maintenance Documentation and Analysis

- Maintenance concept development is not required. Concepts developed under other programs are used.
- Maintenance Engineering Analysis (MEA) documentation is minimized to that necessary to satisfy Helicopter Flotation System requirements.

b. Support Equipment

- Equipment used to build and install the system will be standard. Peculiar Ground Support Equipment (PGSE) will not be required.

c. Repair Parts and Supply Support

-Support will be based on actual needs defined by MEA.

d. Training

-Boeing personnel assigned to maintain the Helicopter Flotation System will receive their training through participation in the fabrication and ground testing of the Flotation System.

-No special training devices or equipment shall be required to train Government personnel.

e. Equipment Publications

-Appropriate sections from existing technical publications and maintenance task sheets from MEA's will be used in lieu of new publications development.

-Maintenance and operational checklists will be prepared as required.

f. Facilities

-Existing facilities shall be used for support.

g. Transportation, Packaging, Storage, and Handling (TPSH)

-Special reusable containers shall not be required.

-TPSH requirements will be satisfied by the most economical accepted commercial practices.

3. MANAGEMENT SUPPORT PLAN

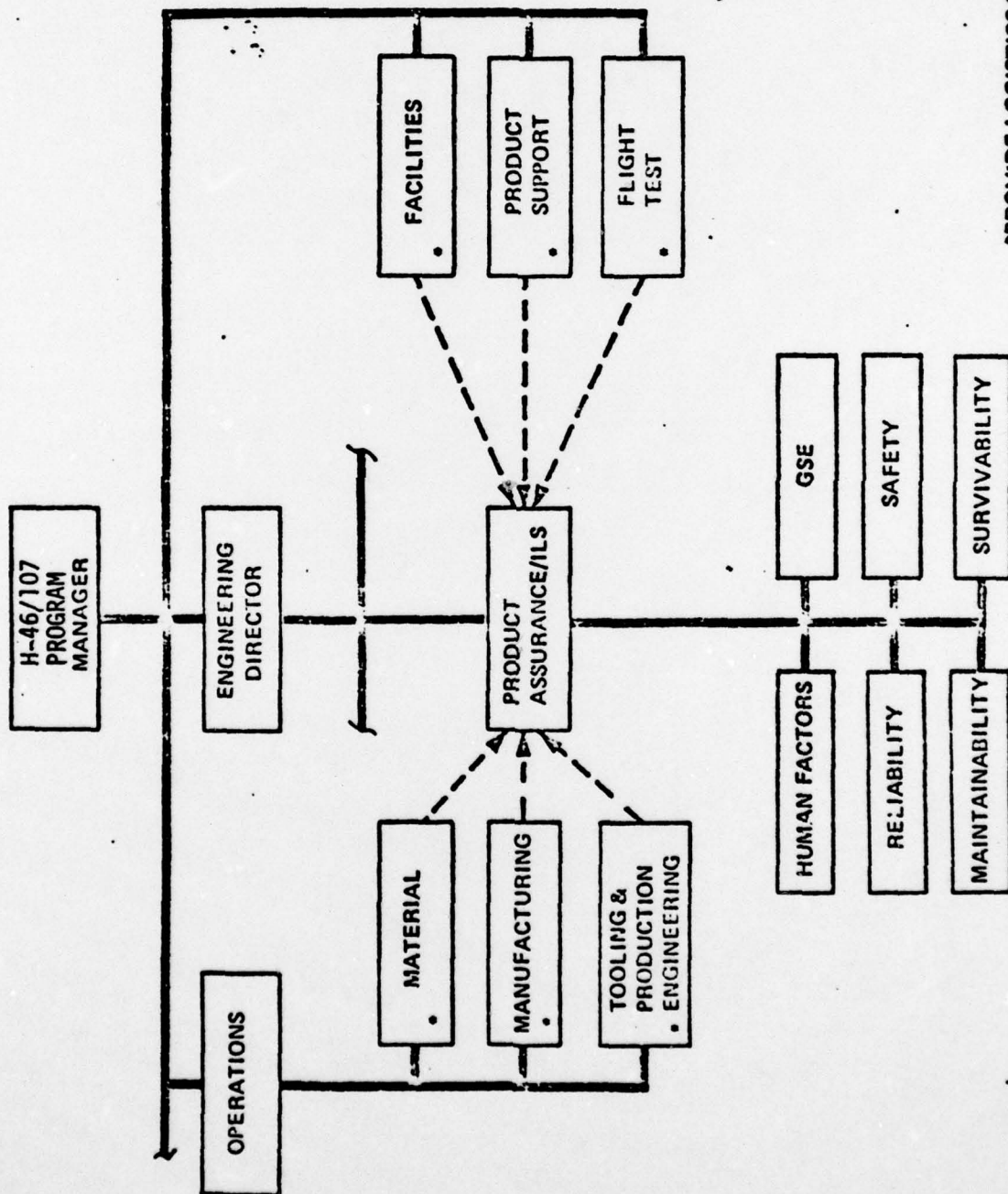
3.1 SCOPE

This plan describes the Contractor's management of the Flotation System's Program support activities. The objective of this plan is to define a program of management, scheduling control, and liaison to ensure effective and efficient logistic support throughout the Helicopter Flotation System Development and Production Program.

3.2 MANAGEMENT RELATIONSHIPS

The Contractor's Integrated Logistic Support (ILS) management interfaces are shown in Figure 1. The H-46/107 Manager, is charged with the overall responsibility for the Contractor's H-46 activities. The PILS/Product Assurance Manager, is responsible for integration of all PILS activities and is the primary point of customer contact within the branch on all flotation logistic support matters.

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*PROVIDE LOGISTICS SUPPORT

Figure 1. Preliminary Integrated Logistics Support Management Interfaces

3.3 MANAGEMENT PROCEDURES

The plan provides for the accomplishment of five key management tasks:

- a. PIIS Revision
- b. Government Liaison
- c. Engineering Change Control Support
- d. Scheduling Control and Status Reporting
- e. Vendor/Supplier Participation

3.3.1. PIIS Revisions

Boeing/Vertol shall prepare and submit revisions as required.

3.3.2. Government Liaison

Liaison with the Government shall be conducted on a continuing basis. When problems arise which affect logistics integration, the Government PIIS Project Officer will be so advised.

3.3.3. Change Control Support

The Boeing/Vertol PIIS Manager or his designated representative shall ensure that all configuration changes which evolve during design, development, fabrication, and testing can be adequately supported prior to commitment. Additionally, he shall take required action to update the PIIS and implement required logistic support actions.

3.3.4. Scheduling Control and Status Reporting

Scheduling control and status reporting shall be an integral part of the Contractor's Cost and Schedule Control System (C/SCS). The PIIS Manager shall monitor PIIS activities and ensure compliance with established schedules. He shall report noncompliance or foreseen delays and problems with amplifying information and recommendations for schedule recovery.

3.3.5. Vendor/Supplier Participation

Boeing/Vertol shall include applicable PIIS requirements in procurement specifications and source control drawings, and shall be responsible for all aspects of support for Contractor-Furnished Equipment (CFE).

In addition, Boeing/Vertol shall require suppliers to provide the drawings and specifications necessary for preparation of Maintenance Engineering Analyses for remove/replace/repair functions and provisioning documentation. Design reviews of supplier items shall be conducted by Boeing/Vertol to ensure that support for supplier items shall be adequate throughout the Helicopter Flotation System Development Program.

3.4 SCHEDULES

Major plan activities are shown in Figure 2.

4. MAINTENANCE DOCUMENTATION AND ANALYSIS PLAN

4.1 SCOPE

This plan describes the requirements for Maintenance Engineering Analyses (MEA's) and resultant documentation used to attain logistics integration for the HFS Development Program. The objective of this plan is to define a program of data and requirements analysis and documentation which will identify and document all support requirements and provide appropriate recording of all logistic events and support usage.

4.2 MANAGEMENT PROCEDURES

There are two key tasks to this plan:

- a. Maintenance Engineering Analysis (MEA) Process
- b. Maintenance Engineering Analysis Documentation

The Product Assurance Maintainability organization shown in Figure 1 shall be responsible for the accomplishment of these tasks. Detail task descriptions are contained in the following paragraphs.

4.2.1 MEA Process

The process described herein shall identify logistics requirements through the analysis of existing data and MEAs documented during the Software Analysis Program. The process shown in Figure 3 contains three critical activities which are described below:

- a. Maintenance Support Concept Definition
- b. Maintainability Analysis
- c. Maintenance Engineering Analysis

4.2.1.1 Maintenance Support Concept Definition

The maintenance support concept for the Helicopter Flotation System shall be predicated on the following:

- a. Support concepts identified for major components under the Software Analysis Program shall be used.
- b. The Contractor shall provide all Organizational and Direct Support maintenance for the Helicopter Flotation System.
- c. The Contractor and/or his subcontractors shall provide General Support and Depot maintenance for Contractor-Furnished Equipment (CFE).

LEGEND

BOEING VERBODEN. COMPANY
SINK RATE DELAY/IMPROVED IN-WATER
STABILITY SYSTEM FOR HELICOPTERS

ISSUED BY _____
CODE NO. _____
DATE ISSUED _____
DATE REVISED _____
PREPARED BY _____
APPROVED _____
APPROVED _____

PROGRAM _____
CONTRACT _____
AUTHORIZATION _____

ACTIVITY	MONTHS AFTER GO-AHEAD																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Management Support																		
PLIS Revisions																		
MEA Data Summary Report																		
MEA Data Final Report																		
GSE Identification																		
GSE Selection																		
GSE Acquisition																		
Repair Parts & Supply Support																		
Identification																		
Selection																		
Acquisition																		
Usage Documentation																		
Training Concept																		
Equipment & Facility Prep																		
Personnel Training																		
Equipment PUBS Definition																		
PUMS Development																		
Contract Maintenance																		
TPSH Rqmts Identification																		
TPSH Support																		
Maintenance Evaluation																		
Sub Assembly Demonstration																		
Demonstration Model Review																		
Support Govt Evaluation																		

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- d. The Government shall provide General Support and Depot maintenance for Government-Furnished Equipment (GFE).
- e. All on-aircraft modifications shall be performed at the Contractor's facility or test site as selected by the Navy.

4.2.1.2 Maintainability Analysis

Qualitative and quantitative maintainability design requirements shall be established in accordance with the maintenance support concept. These requirements (i.e., accessibility, replaceability, interchangeability, repairability, etc.; and quantitative measures of time, rate, and manpower) shall be identified to the equipment designer and included in procurement specifications. Continuous informal and formal design reviews shall be established to ensure that maintainability requirements are satisfied as design progresses.

4.2.1.3 Maintenance Engineering Analysis (MEA)

Maintenance Engineering Analyses shall be performed to determine logistic resources requirements and to verify the inclusion of maintainability requirements in the equipment design. These analyses shall provide:

- a. Detailed identification of maintenance tasks
- b. Frequency of tasks
- c. Personnel quantity and skill level requirements
- d. Elapsed time for task performance
- e. Identification of parts, supplies, and support equipment required

4.2.2 MEA Documentation

The results of the MEA shall be documented to provide the basis for Integrated Logistic Support development. This documentation shall be used to define the following logistic support requirements:

- a. Maintenance Tasks and Task Times
- b. Maintenance Manpower
- c. Maintenance Training
- d. Ground Support Equipment
- e. Supply Support
- f. Transportation and Handling
- g. Facilities
- h. Technical Publications

Documentation will be limited to those tasks performed on the aircraft, i.e., isolate fault, remove and replace, repair in place, adjust, check-out, and preventive maintenance tasks.

4.2.2.2 MEA Documentation Control

The documentation shall be manually prepared, indexed, and maintained on file.

4.2.2.3 MEA Documentation Verification

The MEA documentation shall be verified by the actual performance of maintenance in accordance with the MEA documented procedures. The verification procedures are described in Paragraph 11.0, Maintenance Evaluation Plan.

4.3 SCHEDULES

Major plan milestones are shown in Figure 2.

5. SUPPORT EQUIPMENT PLAN

5.1 SCOPE

Should Ground Support Equipment (GSE) other than shop tools, equipment and devices readily available, be required for use with the Helicopter Flotation System, a Support Equipment Plan will be promulgated.

6. REPAIR PARTS AND SUPPLY SUPPORT PLAN

6.1 SCOPE

Should a "Repair Parts and Supply Support Plan" other than flotation bag repair materials and container repair materials, electrical wiring, retention harness, etc. be required for use with the Helicopter Flotation System, a plan will be promulgated.

7. TRAINING PLAN

7.1 SCOPE

This plan describes the Contractor's methods of identifying and satisfying the Helicopter Flotation System training requirements. The objective of this plan is the definition of a program which shall provide timely and adequate training for Government personnel with minimum requirements for training aids and facilities.

7.2 MANAGEMENT PROCEDURES

This plan provides for the accomplishment of three key tasks:

- a. Development of training concept
- b. Definition of training equipment and facilities
- c. Personnel training

Methods of accomplishment are detailed in subsequent paragraphs.

7.2.1 Development of Training Concept

The training provided Government personnel shall make use of data, test results, and operational experience gained through all phases of the program.

Course durations and material developed and organized for training Contractor personnel shall be used, with appropriate modification and updating, for training Government personnel. Major emphasis shall be placed upon on-the-job training (OJT) with instruction provided, where practicable, by the Contractor personnel who perform the tasks for which training is provided.

7.2.2 Definition of Training Equipment and Facilities

The Contractor shall design and provide training devices and equipment to facilitate the training under separately negotiated contracts.

8. EQUIPMENT PUBLICATIONS PLAN

8.1 SCOPE

Should an "Equipment Publications Plan" be required for use with the helicopter flotation system, a plan will be promulgated.

9. SPECIAL TEST FACILITIES

No special test facilities, other than those in possession of Boeing, will be required except for special Navy testing at remote locations.

10. CONTRACT MAINTENANCE PLAN

10.1 SCOPE

This plan describes the Contractor's methods for satisfying the requirements for aircraft and equipment maintenance during the HFS Program. The objective of this plan is to define a program of Government and Contractor maintenance responsibilities which shall ensure effective maintenance management and support of the helicopter flotation system and a Navy H-46 helicopter.

10.2 MANAGEMENT PROCEDURES

The plan provides for the accomplishment of three key tasks:

- a. Maintenance of Navy H-46 helicopter.
- b. Maintenance of Contractor-Furnished Equipment (CFE)
- c. Maintenance of Government-Furnished Property (GFP)

The Product Support Maintainability organization shall be responsible for the establishment of maintenance procedures and the Boeing Vertol Flight Test Maintenance organization shall be responsible for the accomplishment of maintenance. Management relationships are shown in Figure 1. Detailed descriptions of the key tasks are contained in the following paragraphs.

10.2.1 Maintenance of Navy H-46 helicopter.

The Contractor shall perform the following Organizational and Direct Support maintenance, including Quality Assurance, as identified by Maintenance Engineering Analysis (MEA).

10.2.1.1 Preventive Maintenance

The Contractor shall perform all required servicing and inspections as described by MEA. Inspections identified as maintenance requirements are:

- a. Daily inspections shall be accomplished subsequent to the last flight of the day, or preceding the next day's flying.

Discrepancies discovered during inspections shall be documented and corrected as described in Paragraph 10.2.1.2.

10.2.1.2 Corrective Maintenance

The Contractor shall correct discrepancies noted during ground test, flight, and inspection as necessary for safety of flight. Corrective action shall be identified by the Contractor for other discrepancies, but implementation may be deferred at his discretion. The corrective action taken shall be performed in accordance with the procedures listed in the applicable MEAs. All discrepancies and corrective action will be documented on the Boeing Vertol TEST/FIELD R&M REPORT form, Figure 4. Discrepancies or recommended improvements in the maintenance procedures shall also be documented on this form.

10.2.2 Maintenance of CFE

The Contractor shall be responsible for the required General Support and Depot level maintenance of CFE. This maintenance may be performed at the supplier's facilities at the option of the Contractor.

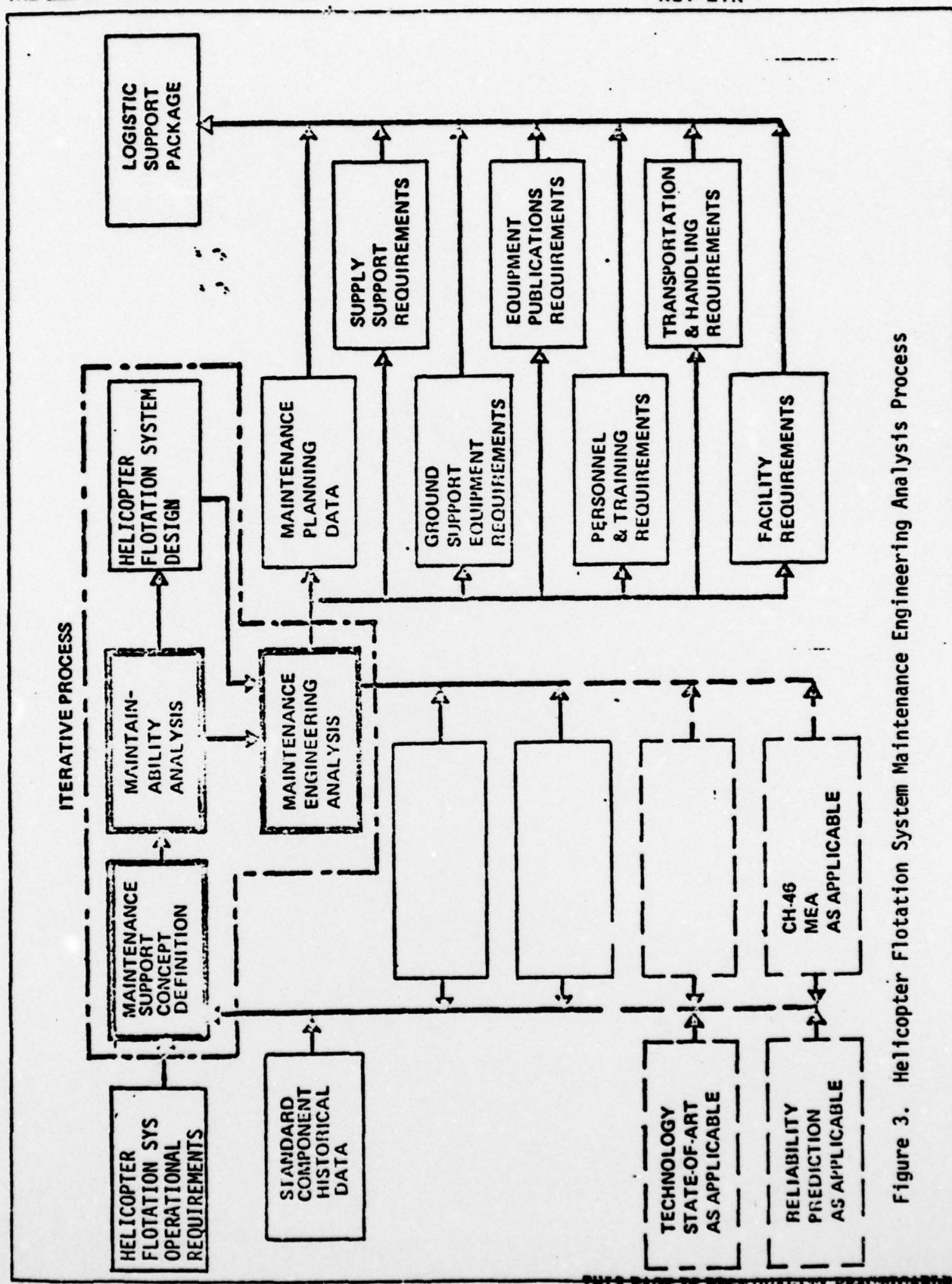


Figure 3. Helicopter Flotation System Maintenance Engineering Analysis Process

FORM 46284 (2/66)

BOEING-VERTOL TEST/FIELD R & M REPORT			
1. JOB CONTROL NO.	2. A/C SERIAL NO.	3. A/C IDENT. NO.	4. DATE
5. A/C MODEL	6. A/C FLIGHT HRS.	7. OWNER	8.
9. WHEN DISCOVERED	10. AIRCRAFT SYSTEM	11. DESCRIPTION OF DISCREPANCY/SYMPTOM OF MALFUNCTION	
a. BEFORE FLIGHT	1. ENGINE		
b. DURING FLIGHT	2. FUEL		
c. AFTER FLIGHT	3. ELECTRICAL		
d. GROUND RUN UP	4. HYDRAULIC		
e. SCHEDULED INSPECTION	5. LUBRICATION		
f. DURING MAINTENANCE	6. AIRFRAME		
	7. LIFT		
	8. AVIONICS		
	9.		
	10.		
12. SAFETY OF FLIGHT EFFECTED: Yes <input type="checkbox"/> No <input type="checkbox"/>		REPORTED BY _____ SIGNATURE _____	
a. AIR ABORT: Yes <input type="checkbox"/> No <input type="checkbox"/>			
b. GROUND DELAY/CANCELLATION: Yes <input type="checkbox"/> No <input type="checkbox"/>			
13. CAUSE OF DISCREPANCY AND CONTRIBUTING FACTORS			
14. CORRECTIVE ACTION			
15. DATE _____			
16. PILOT/MECHANIC _____ SIGNATURE _____			
17. REPAIRED BY _____ SIGNATURE _____			
18. ELAPSED MAINT. TIME: MINUTES	19. NO. MAINT. PERSONNEL	20. TOTAL MAINT. MAN MINUTES	21. DOWN TIME
22. ACCESSIBILITY GOOD <input type="checkbox"/> POOR <input type="checkbox"/>	23. TWO ITEM	YES <input type="checkbox"/> NO <input type="checkbox"/>	
24. DISCREPANT PART NOMENCLATURE	25. NEXT HIGHER ASSEMBLY	26. DISPOSITION OF DISCREPANT PART	
27. PART NO.	28. GROUND SUPPORT EQUIPMENT REQUIRED	YES <input type="checkbox"/> NO <input type="checkbox"/>	
29. MANUFACTURER	a. DESCRIBE EQUIPMENT USES		
30. SERIAL NO.			
31. OPERATING HOURS	32. REPLACEMENT PART NO.		
a. SINCE NEW	b. REPLACEMENT PART SERIAL NO.		
b. SINCE LAST OVERHAUL			
33. DATE INSTALLED	34. SUPERVISOR'S SIGNATURE _____		

Figure 4. Boeing - Vertol Test/Field R & M Report Form

10.2.3 Maintenance of GFP

The Contractor shall perform the Organizational and Direct Support Maintenance authorized by the applicable GFP maintenance allocation chart. This maintenance shall be documented on the Boeing Vertol TEST/FIELD R&M REPORT form. Should higher level maintenance be required, a DD Form 611-1, GFE REJECTION FAILURE DATA, shall be completed and returned with the item of GFP to the Government. The Government shall provide a like serviceable item.

10.3 SCHEDULES

Major milestones are indicated in Figure 2.

11. MAINTENANCE EVALUATION PLAN

11.1 SCOPE

This plan describes the Contractor's methods for the accomplishment of HFS maintenance evaluation.

The objective of this plan is to define a program of maintenance evaluation by the Contractor and the Government which shall assess the HFS maintenance characteristics and provide a basis for maintainability considerations in subsequent phases of the helicopter flotation system development.

11.2 MANAGEMENT PROCEDURES

There are three key tasks to this plan:

- a. Contractor maintenance evaluation and documentation
- b. Maintenance orientation and demonstration
- c. Government maintenance evaluation support

The Maintainability organization shown in Figure 1 shall be responsible for the accomplishment of these tasks and the implementation of this plan. Detail task descriptions are contained in the following paragraphs. (See Figure 3 for MEA Process).

11.2.1 Contractor Maintenance Evaluation and Documentation

The MEAs are the Contractor's initial assessment of maintenance. These analyses are based on evaluation of engineering drawings and specifications performed in conjunction with analysis of data from existing studies and define quantitative and qualitative maintenance requirements for the system. During the HFS development program, the Contractor performs maintenance in accordance with procedures established in the MEA. Maintenance actions shall be documents on the Boeing Vertol TEST/FIELD R&M REPORT form shown in Figure 4. These reports shall be evaluated by the Contractor

and used to verify and update MEA documentation and to provide a basis for maintainability and reliability design improvements. Comments and actions taken shall be noted on the back of the form. These reports shall be indexed and filed with the applicable MEA and shall be available for review by Government personnel. Additionally, the actual performance of complex maintenance tasks shall be witnessed by Contractor Maintainability personnel, and MEAs shall be updated as required.

11.2.2 Maintenance Orientation and Demonstration

The Contractor shall demonstrate to Government personnel selected maintenance tasks and associated special tools and Ground Support Equipment, if such equipment is developed.

11.2.3 Government Evaluation Support

11.2.3.1 Maintenance Support

The Contractor shall make available the following data to facilitate Navy evaluation of the overall maintenance aspects of the system.

- a. MEAs
- b. Test/Field R&M Reports
- c. Support equipment list
- d. Supply list

In addition, Contractor Maintainability engineers shall be available for consultation with Government personnel as necessary.

11.2.3.2 Technical Support

The Contractor shall provide for necessary technical support, if required.

11.3 SCHEDULES

Major plan milestones are indicated in Figure 2.

12. TRANSPORTATION, PACKAGING, STORAGE AND HANDLING (TPSH) PLAN

12.1 SCOPE

This plan describes the Contractor's methods for identifying and satisfying TPSH requirements for the helicopter flotation system. The objectives of this plan are to define a program for identifying items requiring special TPSH design considerations and provide their characteristics to the Government, and providing TPSH support for the helicopter flotation system developmental program.

12.2 MANAGEMENT PROCEDURES

The plan provides for the accomplishment of two key tasks:

- a. Identification of equipment TPSH design requirements.
- b. Developmental program TPSH support

Methods of accomplishment and contingent responsibilities are detailed in subsequent paragraphs.

12.2.1 Identification of Equipment TPSH Design Requirements

Equipment TPSH design requirements, including reusable containers, shall be identified by maintenance and spares engineering analyses of maintenance, maintenance and storage locations, maintenance frequency, transportation modes and interfaces, human factors, and safety factors.

12.2.2 Prototype Program TPSH Support

The Contractor shall clean, preserve, and package Contractor-Furnished Equipment (CFE) by the most economical means in accordance with accepted commercial practices.

12.3 Schedules

Major plan milestones are indicated in Figure 2.

13. LIFE CYCLE COST CONSIDERATIONS

13.1 SCOPE

In order to adequately summarize the projected investments and operating costs associated with logistic support for the project, from the beginning through its first ten years of operational life, acquisition costs for a prototype system must be determined. The conceptual configuration evaluation study, when completed, will provide basic dollar values and a sound basis for a total dollar investment and operating costs.

14. LOGISTIC SUPPORT FOR OPERATIONAL AND MISSION REQUIREMENTS

14.1 SCOPE (to be determined)